
Installing earthquake bracing

Depending on the geographic location, the Meridian 1 floor installation method may or may not require seismic bracing. To meet seismic bracing requirements, the installation must meet the Bellcore or the California OSHPD installation specifications. In locations that do not have earthquakes, a non-seismic installation is acceptable.

In certain seismic-approved applications where the pedestal attachment to the floor may be required but Northern Telecom does not offer the appropriate hardware, the installation organization must contact a seismic engineering firm to install the pedestal that meets Bellcore or California OSHPD requirements. This application could include attachment to a raised wood or steel floor.

The Meridian 1 system of universal equipment modules (UEM's) is designed to withstand most earthquakes. However, to ensure this earthquake security, the installation of two kits is required for each column—a bracing kit provides vertical support to each column of modules and an anchor kit secures each pedestal to the floor.

Installing seismic bracing

The Meridian 1 system has been certified to two of the most stringent seismic specifications for concrete floor mounting: BELLCORE and CALIFORNIA OSHPD:

- BELLCORE is intended for central-office equipment installations. The requirements are defined in the Network Equipment Building System (NEBS), General Equipment Requirements, TR-EOP-000063 issued by Bell Communications Research (BELLCORE). The Meridian 1 system has been certified to meet the maximum severity (Zone 4).
- CALIFORNIA OSHPD as part of the California building code, this specification requires the anchorage of all fixed hospital equipment to be approved by the California Office of Statewide Health Planning and Development (OSHPD), Division of Facilities Development and Financing. Meridian 1 has been certified for such installations under anchorage pre-approval number R-0233.

Selecting the kit

To select the applicable bracing and anchorage kits for your particular installation, you must first determine the following site requirements:

- Identify system configuration (number of columns and modules per column).
- Identify specification requirements (i.e., BELLCORE or CALIFORNIA OSHPD).
- Determine site mounting floor parameters (this information can usually be found in the engineering building drawings):
 - concrete type (hardrock vs lightweight aggregate),
 - minimum concrete compressive strength (megapascals or psi),
 - minimum concrete thickness

First, choose the appropriate module bracing kit using [Table 100](#). Select a separate kit for each column of modules. For column expansion (when an additional module is added to a column which already contains seismic bracing) the expansion bracing kit should be used

Table 100
Seismic Bracing Kits

Seismic Bracing Kit	System configuration
NT8D64CD	1-module
NT8D64CA	2-modules
NT8D64CB	3-modules
NT8D64CC	4-modules
NT8D64BD	expansion

Note: The NT8D64CD kit contains neither bracing rods nor tie bars because these are not needed for single module installations. The NT8D64BD kit does not contain mounting plates as these are not needed for column expansion.

Next, each column must also be secured to the floor. This is accomplished by installing one of two available anchor kits. Select the anchor kit by comparing the site requirements to [Table 101](#). This table shows that either anchor kit can be used to meet the CALIFORNIA OSHPD specification, but only Kit B meets the BELLCORE specification. For those installations where neither specification is required, Kit A is recommended due to its shallower concrete requirement.

Both anchor kits can be used in hardrock concrete as long as the compressive strength exceeds 20.7 megapascals (3000 psi). Only Kit A can be used in lightweight aggregate concrete with a compressive strength greater than 27.6 megapascals (4000 psi). The floor parameters for your installation can usually be found in the engineering building drawings.

Table 101
Seismic Anchor Kit

Kit	Seismic Anchor Kit	BELLCORE	CAL OSHPD	Concrete thk (min)	Light-weight
A	NT8D64BE	No	Yes	90 mm (3.54")	Yes
B	NT8D64CE	Yes	Yes	180 mm (7.09 ")	No

The kits listed in [Table 101](#) contain commercially available mounting hardware. You have the option of purchasing the contents directly from the manufacturer (using the listing below) or ordering the kits directly from Northern Telecom.

- Kit A (NT8D64BE) contains four of each of the following items:
 - Hilti HDI 3/4" (box of 25, manufacturer part# 457564), Hilti Corporation (918) 252-6000 or, Multi-Set II (manufacturer part# RM-34), ITW Ramset/Redhead, Incorporated (219) 874-4217
 - Hex head bolt, Ø.3/4"-10 x 1.50" long, steel material, zinc plate finish
 - Flat washer, internal diameter = 0.812", outside diameter = 1.469", thickness = 0.120", steel material, zinc plate finish
- Kit B (NT8D64CE) contains four of the following item:
 - Hilti HSL M16/25 (box of 10, manufacturers part# 665934), Hilti Corporation (918) 252-6000

Finally, to aid installation, four kits have been developed. The seismic anchor hole template kit (NT8D64BH) provides a mylar template to aid floor marking. Only one kit is needed for an installation and this kit is reusable.

Drilling the floor

The following tools are required to drill the holes for the anchor bolts:

- dark marking pencil
- center-punch
- rotary hammer drill
- carbide-tip drill bit:
 - 25.4 mm (1.00 inch) diameter (for Kit A, NT8D64BE)
 - 24.0 mm (0.94 inch) diameter (for Kit B, NT8D64CE)
- blowout bulb or compressed air source
- hammer or mallet
- vacuum

WARNING

Wear safety goggles when drilling anchor holes. For all drilling, use the appropriate tools and follow local codes. Make sure to obey all safety and warning precautions provided by the hammer drill and anchor bolt manufacturers.

Note: The following description applies only to installations into concrete floors.

- 1 Using the equipment room floor plan mark the position of all of the columns.
- 2 Center-punch each of the hole centers.

- 3 Using a carbide-tipped drill bit, hammer drill the holes to the size and depth shown in [Table 102](#).

Table 102
Anchor hole sizes

Kit	Kit part number	Hole diameter	Hole depth
A	NT8D64BE	1.00 inch	3.18 inch
B	NT8D64CE	24 mm	125 mm

Note: Special care should be taken in drilling the holes. The holes have to be drilled straight and perpendicular to the floor surface in order for the anchors to be installed correctly. The drill fixture kit can aid this process.

- 4 Should you hit reinforcing bar or the hole breaks through, abandon that hole and use the secondary hole location indicated in the anchor hole template.
- 5 Remove any debris from the holes with a blowout bulb or compressed air. Use a vacuum to dispose of the debris.
- 6 If the mounting plates are not to be installed immediately, cover the anchor holes to prevent debris from falling into them.

Installing anchor plates

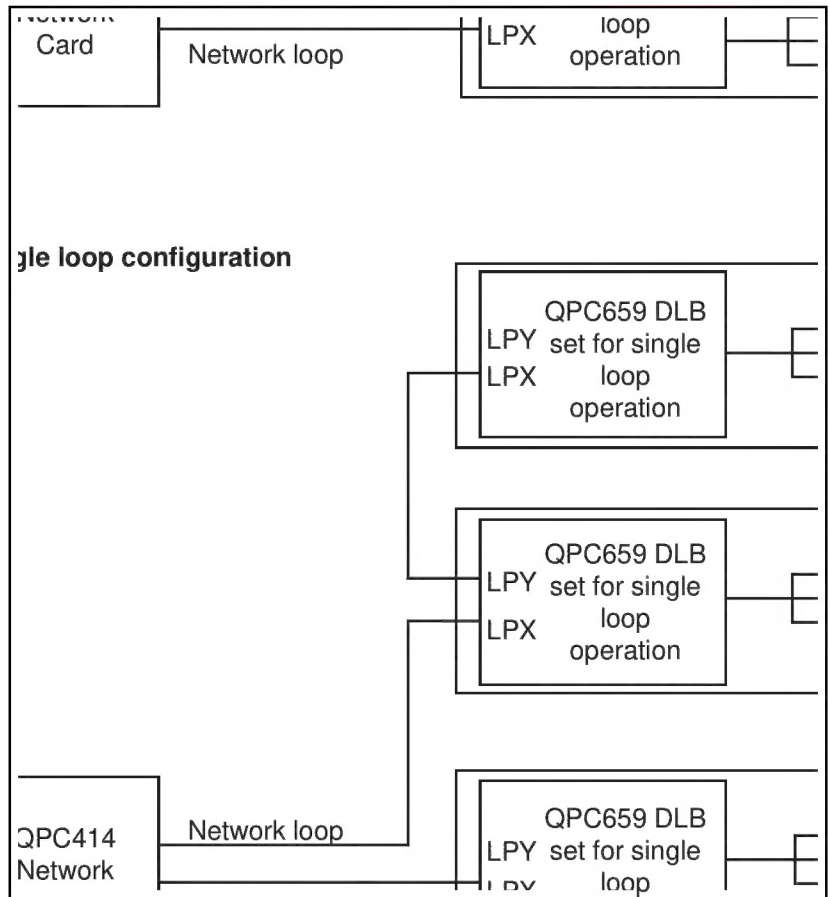
The following tools are required to install the anchors and the anchor plates:

- Kit A
 - setting tool (Hilti HST 3/4", manufacturer part#329821)
 - 1 1/8 inch open-end wrench
- Kit B
 - 24 mm open-end wrench

Procedure for installing Kit A

- 1 Insert the anchors into the holes. Use the manufacturer's setting tool to install each anchor flush with the surface of the concrete. The setting tool is required for the Hilti anchor.
- 2 Locate the two mounting plates for each column over the anchors. Place an adapter bushing into each of the plate holes and insert a 3/4-inch diameter bolt and flat washer as shown in [Figure 128](#).

Figure 128
Mounting plate installation



- 3 Level the plates with shims. Leave the stack of shims exposed until all leveling has been completed (this will allow the addition or removal of shims if necessary).
- 4 If the installation must meet CALIFORNIA OSHPD, tension proof load testing is required on 50 percent of the anchor bolts. These anchors must be tested to 24,020 newtons (5400 pounds) tension and 122 newton-meters (90 foot-pounds) torque. Any failure requires testing of all remaining anchors.
- 5 Go to [“Installing rods” on page 348.](#)

Procedure for installing Kit B

- 1 Locate the two mounting plates for each column over the anchor holes. Insert the anchors into the holes and tap the anchors into place with a mallet.
- 2 Level the plates with shims. Leave the stack of shims exposed until all leveling has been completed (this will allow the addition or removal of shims if necessary).
- 3 If the installation must meet CALIFORNIA OSHPD, tension proof load testing is required on 50 percent of the anchor bolts. These anchors must be tested to 6230 newtons (1400 pounds) tension and 122 newton-meters (90 foot-pounds) torque. Any failure requires testing of all remaining anchors.
- 4 Go to [“Installing rods” on page 348.](#)

Installing rods

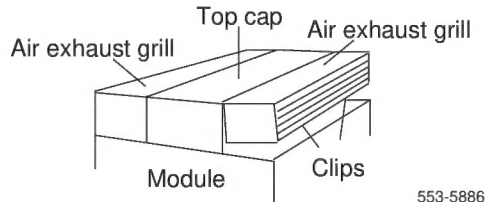
The following tools are required to install the rods:

- 5/16 inch socket wrench
- 1/2 inch open-end wrench (for rods)
- 9/16 inch open-end wrench (for nuts)

Note: The rods should be installed before you position the columns.

1 Remove the top cap on each column:

- Pull forward on the clips underneath the front edge of each air exhaust grill on the top cap. Lift up and remove the grill.



- Use a 5/16 in. socket wrench to remove the six screws that secure the top cap (see [Figure 129](#)). Lift the top cap from the column.

2 Remove the side panels on the exterior of each module by removing the four bolts that secure the panel.

Note: In a two-tier or three-tier column, with adequate ceiling clearance, you may be able to thread the rods down the sides of the column without removing the side panels. Insert each rod into its hole at the top of the column.

3 Install bracing rods:

- Position each rod in one of the vertical slots along the sides of the modules and insert the rods into the threaded holes in the pedestal (see [Figure 130](#)). Tighten the rods in by hand or snug tight with a 1/2" open-end wrench.
- Place a tie bar over each pair of rods, from side to side across the top of the module, as shown in [Figure 130](#).
- Secure the tie bars with flat washers and hexagon nuts. Torque with 9/16" wrench to 17.6 joules (13.0 ft-lbs).

Note: When installing expansion rods as part of the NT8D64BD bracing kit, the rods are screwed into the previously-installed rods by means of a coupling nut. The resulting two-piece rod should be secured in the same manner as the single rod described above.

- 4 Reinstall the top cap and grills:
 - Position each top cap and install the bolts that secure it.
 - Replace the air exhaust grills at the front and rear of each top cap.
- 5 **For a single-column system**, reinstall the side panels on each module.
For a multiple-column system, install NT8D49AA Spacer Kits between adjacent columns:
 - Attach gaskets to both sides in the front section of each spacer (see [Figure 131](#)).
 - Attach a spacer to one side of each module that will be next to another module, except on the end column (see [Figures 132](#) and [133](#)). Insert the screws through holes in the trim panels.
- 6 Go to [“Positioning and leveling the system” on page 350](#).

Positioning and leveling the system

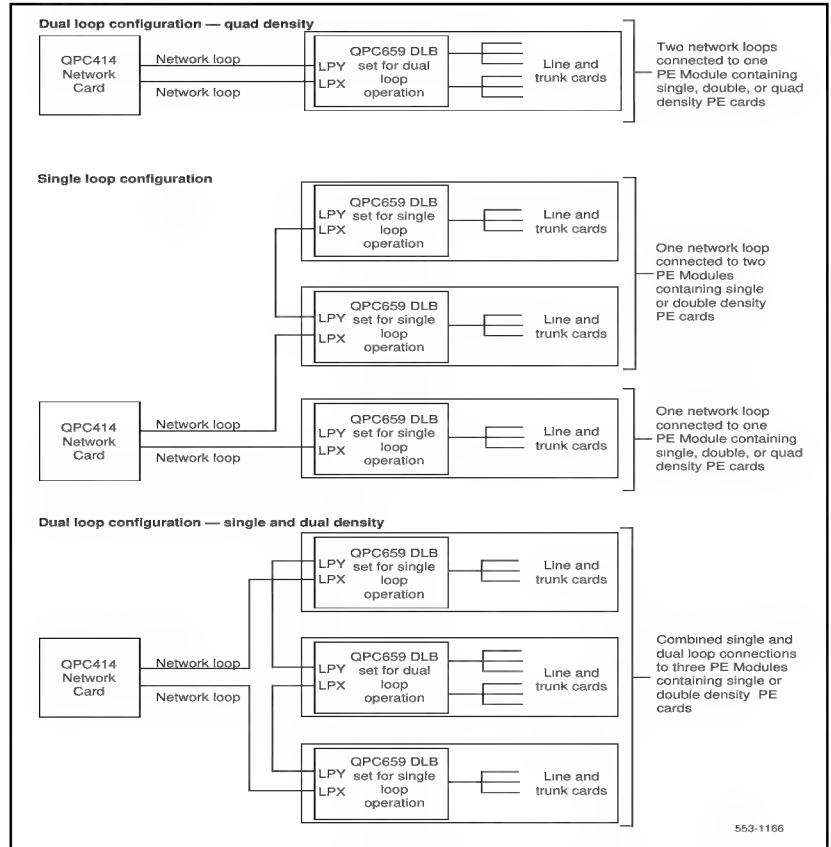
The following tools are required to position and level the system:

- socket wrench (anchor bolts):
 - 1 1/8 inch for Kit A
 - 24 mm for Kit B
- 5/8” socket wrench (pedestal bolts)

Follow the steps below to level the system:

- 1 Loosen the anchor bolts until the mounting plates are free to move.
- 2 Starting from one end of the line-up, move a column into position.
- 3 Loosely install the pedestal mounting hardware (1/2” bolts, lockwasher, plain washer, and insulating washer), using the plastic insulating washers.
- 4 Re-level the column, adding or removing shims as needed. Go back and re-level any other columns.

Figure 129
Top cap assembly



- 5 Repeat the above steps until all columns have been positioned.
- 6 Slide shims completely under seismic plates. First tighten the pedestal mounting bolts, torque to 122 Newton-meters (90 ft-lbs). Then, tighten the concrete anchors, torque to 48 Newton-meters (35 ft-lbs).

Figure 130
Installing bracing rods for column support

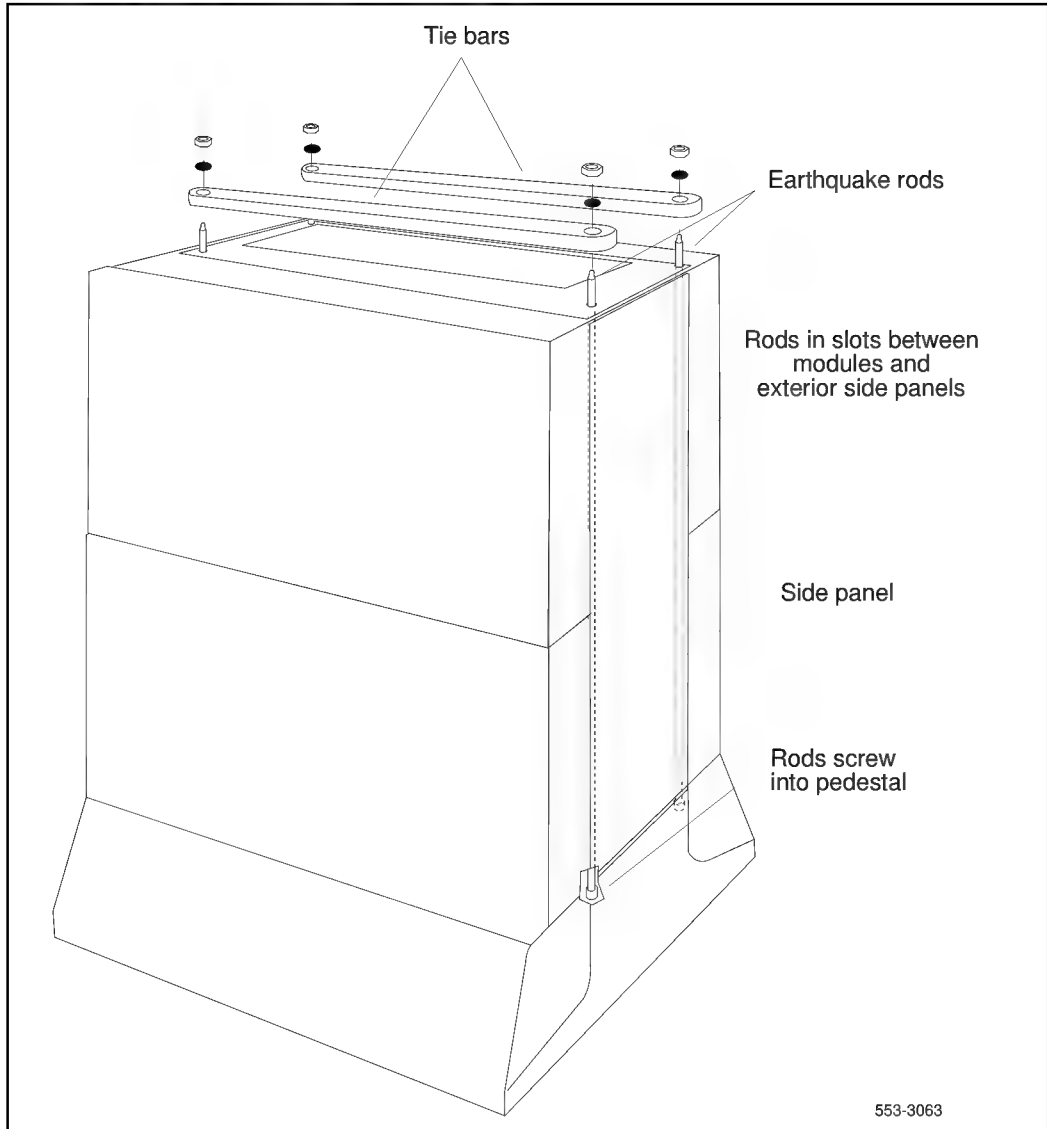


Figure 131
Positioning spacer gaskets

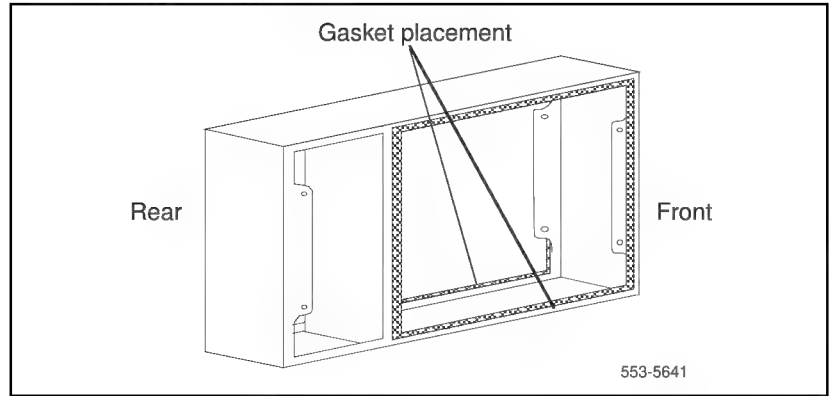


Figure 132
Spacer positioning

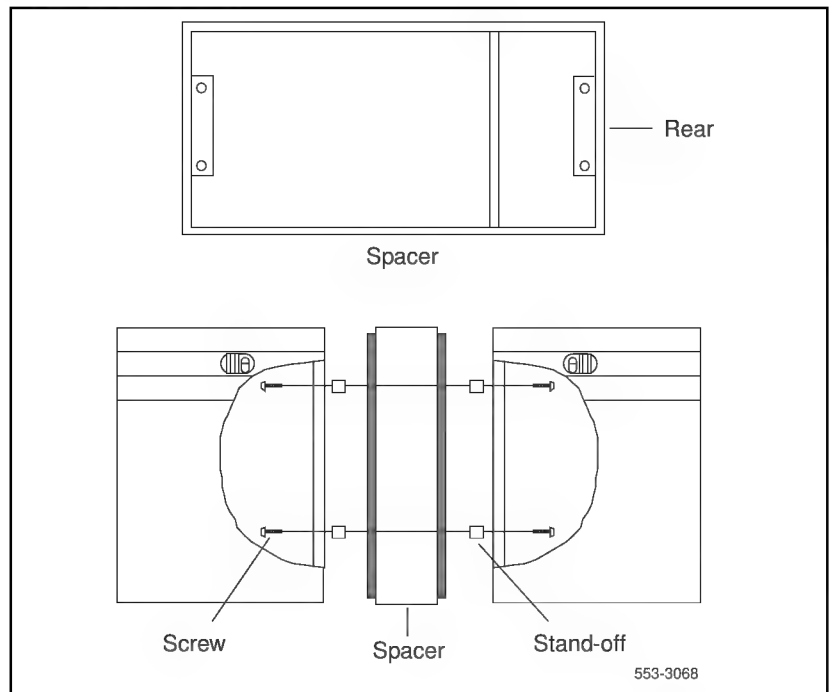
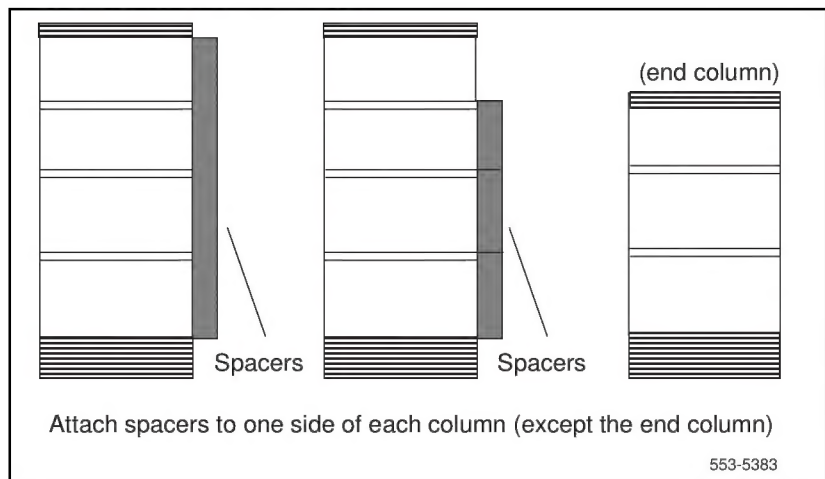


Figure 133
Adding spacers to columns



Installing non-seismic bracing

In certain applications where earthquakes do not occur, the pedestal attachment to the floor does not have to meet Bellcore or California OSHPD requirements. This application could include attachment to a raised wood or steel floor using the kits described below.

Selecting the kit

If the installation does not have to meet the Bellcore or OSHPD requirements, the installer can design and install an attachment suitable for the particular installation using:

- NT8D64BF Floor Mounting Kit
- NT8D6401 Insulating Washer Kit

NT8D64BF Floor Mounting Kit

The NT8D64BF Floor Mounting Kit provides the hardware required to secure a Meridian 1 column to concrete floors for non-seismic installations i. e., for a non-Bellcore or OSHPD approved installation.

The kit provides four sets of hardware however, a minimum of two anchors must be used diagonally opposite to secure the column pedestal to the floor. The kit also provides four insulating washers that can be used during kit installation.

NT8D6401 Insulating Washer Kit

The NT8D6401 Insulating Washer Kit is used for attaching the Meridian 1 to the floor when the installer is using a third party anchor kit instead of the Northern Telecom's NT8D64BF Floor Mounting Kit.

In this case, one NT8D6401 Insulating Washer Kit is required for each pedestal to electrically insulate the mounting bolts from the pedestal casting. Each NT8D6401 Insulating Washer Kit provides four insulating washers.

Non-seismic anchor kit installation instructions

To install the NT8D64BF Floor Mounting Kit:

- 1 Mark the position of each Meridian 1 column using the equipment room floor plan.
- 2 Mark the location of all four anchor holes for each column using a dark marking pencil.
- 3 Center-punch the center of each hole in the concrete.
- 4 Make the hole in concrete by using a rotary hammer drill to the following size and depth:
 - hole diameter 0.625"
 - hole depth 2.00"
- 5 Abandon the hole if you should hit a reinforcing bar or the hole breaks through. A minimum of two diagonally opposite anchors are required for this application.
- 6 Remove any debris from the hole with a blowout bulb or compressed air. Use a vacuum cleaner to dispose of the debris.
- 7 Insert the anchors into the holes. Use the manufacturer's setting tool to install each anchor flush with the surface of the concrete. Use the Hilti HST 1/2" setting tool, manufacturer part # 000329805 or equivalent.
- 8 Position each column over the anchors.
- 9 Insert bolt, metal washer, and shoulder washer into the pedestal hole, as shown in the [Figure 134](#). On the far side of the pedestal flange, thread a plastic washer, a metal washer, and the nut onto the bolt.
- 10 Insert the bolt into the concrete anchor.
- 11 Tighten the nut to the pedestal flange and torque it to the 34 Newton-meters (25 ft-lbs) using a 3/4" socket wrench. Do not overtighten.
- 12 Repeat steps 8 to 11 for remaining bolts.

Figure 134
Pedestal mounting flange (rear view)

